Breeding Performance of the Red-Backed Shrikes (*Lanius collurio*) in a Riparian Habitat

Kızılsırtlı Örümcekkuşunun (*Lanius collurio*) Bir Riperyan Habitattaki Üreme Performansı

Research Article

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ABSTRACT

We investigated the breeding performance and nest site properties of the red-backed shrikes in a small population in Nallihan Bird Sanctuary in Turkey. We carried out the field studies during the 2006 and 2007 breeding seasons. We monitored 12 nests of 7 breeding pairs in the 2007 breeding season. Most of the territories were near the Aladag Stream-Riparian Habitat. The distance between the nests were 110 ± 20 m. The red-backed shrikes built their nests in the thorny bushes at the average height of 80 ± 32.5 cm above the ground. Only one pair could raise fledglings within the monitored pairs. Four Nests were predated during the incubation and four nests were predated during nestling stage in the 2007 breeding season. Yet, the previous year we had detected at least one fledgling within 6 of the 8 territories. We estimated that this small population had suffered from high nest predation at the Nallihan Bird Sanctuary after a successful breeding season. Long-term studies are required to obtain more detailed information about the populations of the red-backed shrikes in Turkey.

Key Words
The red-backed shrike, breeding biology, nest site.

ÖZET

Bu çalışmada, kızılsırtlı örümcekkuşunun Nallıhan Kuş Cenneti'ndeki küçük bir populasyonunun üreme performansı ve yuva yeri özellikleri araştırılmıştır. Saha çalışmaları 2006 ve 2007 üreme dönemlerinde gerçekleştirilmiştir. 2007 üreme döneminde 7 üreme çiftine ait 12 yuva takip edilmiştir. Teritoryumların büyük çoğunluğunun Aladağ Çayı riperyan habitatında bulunduğu kaydedilmiştir. Yuvalar arasındaki mesafe 110 ± 20 m'dir. Kızılsırtlı örümcekkuşları yuvalarını dikenli çalılara, yerden ortalama 80 ± 32.5 cm yüksekliğe yapmışlardır. Takip edilen çiftlerden yalnızca bir tanesi kanatlanmış yavrular yetiştirebilmiştir. 2007 üreme döneminde dört yuva inkübasyon, dört yuva da yavru aşamasında predasyona uğramıştır. Buna rağmen, bir önceki üreme döneminde 8 teritoryumun içinde 6 tanesinde kanatlanmış yavrular gözlenmiştir. Bu küçük populasyonun başarılı bir üreme dönemi sonrası maruz kaldığı yoğun yuva predasyonu nedeniyle başarısız olduğu tahmin edilmektedir. Türkiye'deki kızılsırtlı örümcekkuşu populasyonları hakkında daha ayrıntılı bilgi sahibi olmak için uzun dönemli çalışmalara ihtiyaç vardır.

Anahtar Kelimeler
Kızılsırtlı örümcekkuşu, üreme biyolojisi, yuva yeri.

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INTRODUCTION

Predation has been assumed to be an important case of the nest failures in different habitats [1-3] and several studies of terrestrial birds have shown higher rates of nest predation among the open-nesting species than among compared with the cavity-nesting species [2]. The red-backed shrikes, *Lanius collurio* are medium-sized migrant songbirds. They are territorial and the breeding pairs defend their breeding sites. They build open cup nests particularly in shrubs with a height of 1-1.5 m. They are single brooded but if they fail, they usually build a new nest and they have a new breeding attempt [4]. The red-backed shrikes have been evaluated as "declining" according to the European Threat Status in breeding sites for all of Europe [5]. It is known that this species breeds regularly in Turkey [6]. Defining the nest success and the nest predation rate of the threatened open cup nested songbirds is crucial part of producing management plans.

We aimed to determine the breeding performance of the red-backed shrikes in a small population in the Central Anatolia Region of Turkey. We observed the red-backed shrike population at the Nallihan Bird Sanctuary, which is an important bird area in Turkey.

STUDY AREA AND METHOD

The study was conducted at the Nallihan Bird Sanctuary -a national protection site, with an approximate area of 451 ha. At the northern part of the Sariyar Reservoir (40° 06′ N and 31° 36′ E) the Aladag Stream forms a delta and flows into a lake. This area is known as the Nallihan Bird Sanctuary in the province of Ankara, Turkey. The study area is consisted of densely vegetated areas near the Aladag Stream, agricultural areas and steppe-vegetated hilly areas with scarce bushes. The study area can be seen in Figure 1 [7].

Field studies were carried out from April to September in years in 2006 and 2007. In the first year we did not focus on locating the nests. We visited the nests weekly to avoid any possible influence of the visits on the nest predation rate [8]. The distance between the nests from the first attempts of the breeding pairs were determined using a Global Positioning System (GPS) device. The nest plant species, their heights, the height of the nests from the ground and other nest properties (e.g height and diameter) were recorded for all the nests that were detected during the 2007 breeding season. The quantitative results were presented as "mean values ± standard deviation".

RESULTS

The red-backed shrikes at the study area were seen first in the beginning of early May. The number of birds reached its maximum in mid-May, in both years. (Figure 2). Only breeding pairs stayed at the study area in the last days of May.

We determined 8 breeding territories in the study area during the 2006 breeding season but we did not locate their nests. Only one of them was far from the Aladag Stream, which was located on a pasture land near an agricultural area. We detected that most of the territories in 2006 were also occupied in 2007 by the breeding pairs. In 2007, whilst 6 of 7 breeding pairs' nests were near the Aladag Stream, the other one was located in a hilly area. The territories near the Aladag Stream were along a 500 m transect and nests were close to each other (110 ± 20 m, n= 5).

Most of the nests were in blackberry bushes (*Rubus discolor*). All the nest supporting plants found in the study area provided in Table 1.

The nest supporting plants were recorded to be 211 ± 120 cm (n= 10) tall. The nests were built at the height of 80 ± 33 cm (n= 10) above the ground. The diameter and height of the nests were 11.6 ± 0.9 cm and 6.4 ± 1.0 cm (n= 9), respectively.

During the 2007 breeding season, 7 breeding pairs were monitored. While one of the nests was located during the nestling period, while the others were located during the nest construction and egg-laying stage. Because we did not check the nests daily, we could not determine the exact clutch size of the nests. Yet, we recorded a minimum of 5 and a maximum of 6 eggs/nestlings within the nests.

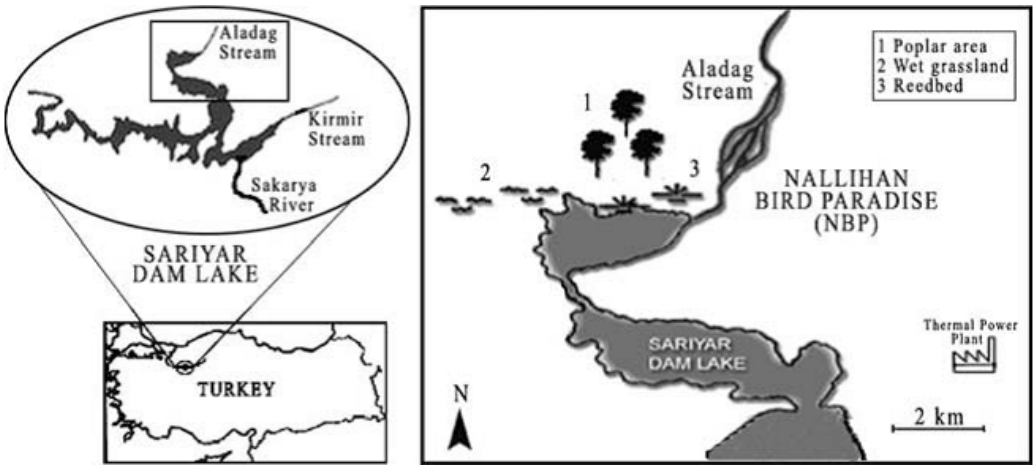

Figure 1. Study area-Nallihan Bird Sanctuary [7].

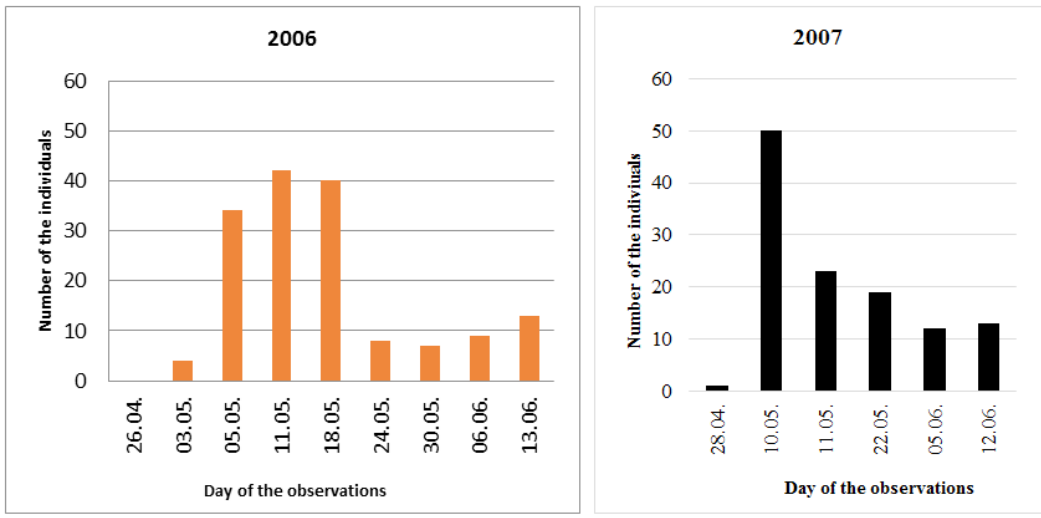

Figure 2. The numbers of the red-backed shrikes in the first part of the two breeding season.

Table 1. The plant species that the red-backed shrikes were built on at the Nallihan Bird Sanctuary during the 2007 breeding season.

Plant species	Number of the Nests
Rosa sp.	1
Paliurus spina	1
Rubus dicolor	5
Rhamnus sp.	2
Ficus carica	1

We also observed the fledglings within 6 of the 8 territories in late June and throughout July of 2006. All of the 7 nests were depredated during the 2007 breeding season. One of the pairs abandoned its territory. The others built new nests near their predated nests. Whilst the abandoned nests included the some parts of nest contents, we did not detect any in the other failed nests.

When we evaluated all of the breeding attempts, only one of the 12 nests was successful

in the 2007 breeding season. Among all the monitored pairs, only one pair grew up to be fledglings in their third breeding attempt. Four of the nests were predated during incubation and another four were predated during nestling stage. We detected a pair that built three nests at different times during the 2007 breeding season but interestingly we did not recognize any eggs or chicks at these nests.

We did not witness any predation event. Some potential nest predators were seen at the study site, either observed at the nest sites or their surroundings (e.g. the red fox-*Vulpes vulpes*, the domestic cat-*Felis silvestris*, the hooded crow-*Corvus cornix*, and the Eurasian magpie-*Pica pica*). There were also a number of small mammal nest holes near the red-backed shrike nest sites.

DISCUSSION

The Nallihan Bird Sanctuary is an important area for the red-backed shrikes. The results of this study showed that Nallihan Bird Sanctuary was used both as a stopover and breeding area by the shrikes. According to our results, in this area the breeding success of the red-backed shrikes showed annual variation. While most of the pairs were successful in 2006, the breeding success in 2007 was extremely low due to nest predation.

Re-occupation of the same breeding sites after a successful breeding season was an expectable case for the red-backed shrikes in our study area. According to habitat copying hypothesis, animals use the breeding performance of their conspecifics as a cue for making decision on their future breeding sites [9,10].

Nest predation is the primary cause of breeding failure in most of the bird species [11]. The red-backed breeding in grasslands in south-central Sweden breeding in grasslands were reported to have a nest predation rate of 39% [12]. Nikolov (2004) and Pasinelli et al. (2007) suggested that about 68% and 66% of the nest loses resulted from the predation events [13]. Besides the red-backed shrikes, nest predation is the most important factor that influences the breeding success of the other shrike species [14-16]. Nest predation risk plays a crucial role in the decisions of songbirds to settle in a particular habitat [17]. This species favors shrubby pastures and habitats with sustained low vegetation allowing good visibility of the ground living beetles [18,19]. In the Nallihan Bird Sanctuary, the red-backed shrikes preferred to breed in dense vegetation near the stream but they rarely used agricultural areas and the hilly areas with steppe vegetation as breeding territories. It was revealed that the population of the red-backed shrikes was under intense nest predation pressure in some seasons at the Nallihan Bird Sanctuary. They might have built their nests in dense vegetation because of the nest predation pressure. In this area, building well-concealed nests could be a strategy to avoid nest predation for the red-backed shrikes. On the other hand, the nests near the Aladag Stream were in a close proximity to each other compared to distances mentioned in other studies [20,21]. This might have been one of the causes of the high nest predation rate, facilitating the availability of the nests to predators [22]. On the contrary, in some cases, population density and predation risk show an inverse relationship [23]. Despite our sensitive treatments, observer effect could have been another reason for high nest predation rate [24,25].

In conclusion, nest predation is a vital factor on the life history traits of birds [26] and so nest predation studies are very important to gain a deeper understanding of the life of birds.

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